

REMARKS

Claims 36-48\* remain pending in this application, with Claims 36 and 37 being independent.

Applicants have amended Claims 36 and 37, indicating that the thermoset compounds of the Markush group may appear individually or in combination with those recited.

Applicants turn now to the substance of the Action.

Section 103 Rejections

Claim 36 remains rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over U.S. Patent No. 6,207,786 (Ishida) for the reasons given at pages 3-4 of the Action.

Claims 36-47 remain rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Ishida as applied to Claim 36 and further in view of U.S. Patent No. 6,906,120 (Davis) and further in view of U.S. Patent Nos. 6,034,194 (Dershem) or 6,034,195 (Dershem) for the reasons given at pages 4-6 of the Action.

Applicants traverse these Section 103 rejections.

---

\* The Action again does not mention Claim 48, though the claim remains pending herein.

As the Examiner is aware, the present invention is directed to and claims a thermosetting resin composition for adhering materials with dissimilar coefficients of thermal expansion. Thus, the present invention is defined as a thermosetting resin composition, which consists essentially of a) a benzoxazine compound in liquid form at room temperature, b) thermoset compounds selected from the group consisting of epoxy, cyanate ester, maleimide, acrylate, methacrylate, vinyl ether, styrenic, vinyl ester, propargyl ether, diallylamide, aromatic acetylene, benzocyclobutene, thiolenes, maleate, oxazoline, and itaconate, c) optionally, one or more anti-oxidants, bleed control agents, fillers, diluents, coupling agents, adhesion promoters, flexibilizers, dyes and pigments, and d) a cure initiator.

The Action seems to focus on Applicants' use of the phrase "and the like" in the specification to "suggest that other thermosetting compounds not specifically set forth therein could be used in the invention." (See Action, page 3, paragraph 6 and page 5, paragraph 1.)

However, the invention for which protection by way of patent is sought is defined by the claims. The claims as they read require a thermosetting resin composition, which consists

essentially of three separate components and an optional fourth. The "consisting essentially of" transitional phrase as is well recognized closes the claim to only the specified materials "and those that do not materially affect the basic and novel characteristic(s)" of the claimed invention. MPEP § 2111.03.

One of the required elements of the pending claims is one or more thermoset compounds. The thermoset compound is defined through the use of a Markush group -- i.e., a thermoset compound "selected from the group consisting of". A Markush group is a form of drafting a claim term that is widely used, and is approved by the U.S. Patent and Trademark Office to limit the claim to a list of specified alternatives. See e.g. Gillette Co. v. Energizer Holdings, Inc., 405 F.3d 1367, 1372 (Fed. Cir. 2005); MPEP § 803.2.

The thermoset compounds are thus defined to be recited from a Markush group, which Markush group does not include phenolic or poly(arylene ether).

Ishida, the primary document in the Examiner's Section 103 rejection, is directed to and claims a ternary composition comprising: a) from about 10 to about 80 weight percent of a benzoxazine monomer, b) from about 10 to about 80 weight percent of an epoxy reactant, and c) from about 1 to about 80 weight

percent of a phenolic resin or phenolic compound, where the weight percents are based upon the total binder from a, b, and c in said composition, and the benzoxazine monomer comprises on average at least two benzoxazine rings per molecule.

Thus, as Ishida defines his invention as a ternary composition, Ishida expressly requires each of benzoxazine, epoxy and phenolic, and each of these three particular components in the amounts specified.

Here, the invention is defined in Claim 36 in part with regard to a benzoxazine in liquid form at room temperature together with a distinct group of thermoset compounds in a Markush group. The Markush group does not include phenolic and is closed off from that compound.

And Claim 36 requires that the materials to be adhered have dissimilar coefficients of thermal expansion. Ishida makes no such reference to the materials to be adhered having dissimilar coefficients of thermal expansion.

A document cited under Section 103 must provide some teaching or suggestion to prepare a particular combination of components in order for the cited document to render a particular combination obvious; "[e]ven when obviousness is based on a single prior art reference, there must be a showing

of a suggestion or motivation to modify the teachings of that reference." In re Kotzab, 55 USPQ2d 1313, 1316-1317 (Fed. Cir. 2000), citing B.F. Goodrich Co. v. Aircraft Breaking Sys. Corp., 37 USPQ2d 1314, 1318 (Fed. Cir. 1996). No such suggestion or motivation is provided in Ishida.

Thus, the Section 103 rejection of Claim 36 as allegedly being unpatentable over Ishida should no longer be maintained.

As regards the second Section 103 rejection, in addition to Ishida, three secondary documents are cited as references to remedy the deficiencies of Ishida, the first of which being Davis.

Davis is directed to and claims an adhesive formed from a composition comprising, based on 100 weight percent of the resin portion of the composition: about 5 to about 50 weight percent of a poly(arylene ether) resin having a number average molecular weight of about 8,000 to about 13,000; about 50 to about 90 weight percent of a thermosetting resin selected from cyanate esters, polyesters, epoxy, benzoxazines, benzocyclobutene resins, and mixtures thereof; about 0.5 to about 15 weight percent of a toughening agent selected from poly(vinyl butyral-co-vinyl acetate) resins, partially

hydrolyzed poly(vinyl butyral-co-vinyl acetate) resins, styrene-butadiene-styrene block copolymers, styrene-ethylene-styrene block copolymers, and styrene-ethylene-butylene-styrene block copolymers; and about 0.1 to about 7 weight percent of a cure agent.

Davis requires among other things a poly(arylene ether) resin, and that resin must be present in an amount of about 5 to about 50 weight parts. Applicants, in their claims, require no such resin, but do require instead a benzoxazine in liquid form at room temperature, and one or more thermoset compounds defined by way of a Markush group where the species of the group are selected from epoxy, cyanate ester, maleimide, acrylate, methacrylate, vinyl ether, styrenic, vinyl ester, propargyl ether, diallylamide, aromatic acetylene, benzocyclobutene, thiolenes, maleate, oxazoline, and itaconate. None of the species of the Markush group is a poly(arylene ether).

As noted above, a Markush group limits the claim to a list of specified alternatives.

And Claims 36 and 37 require that the materials to be adhered have dissimilar coefficients of thermal expansion. The material doing the adhering -- the inventive composition

defined -- does not recite poly(arylene ether) in the Markush group identifying the one or more thermoset compounds to be used with the benzoxazine in liquid form. Davis makes no such reference to the materials to be adhered having dissimilar coefficients of thermal expansion.

Dershem '194 is directed to and claims an adhesive composition consisting essentially of a liquid bismaleimide having a certain structure.

Dershem '195 is directed to and claims a die-attach paste comprising in the range of about 10 to 80 weight percent of a thermosetting resin composition, and in the range of about 20 to 90 weight percent of a conductive filler. The thermosetting resin composition comprises a) a liquid maleimide, b) in the range of about 0.01 to about 10 equivalents of a vinyl compound per equivalent of maleimide, c) in the range of 0.2 to 3 weight percent of at least one free radical initiator, based on the total weight of the composition, and d) in the range of 0.1 to 10 weight percent of at least one coupling agent based on the total weight of the composition. The coupling agent has both a co-polymerizable function and a silicate ester function.

Thus, Dershem '194 and '195 speak to liquid maleimide containing thermosetting resin compositions.

While Davis refers generally to benzoxazines as a component for use in combination with the above-noted poly(arylene ether), each of Dershem '194 and '195 speak to liquid maleimide containing thermosetting resin compositions. The present invention is defined in terms of a composition having a benzoxazine (not maleimide) in liquid form at room temperature in combination with one or more thermoset compounds, which are defined in the claims by way of a Markush group, none of the species of which is defined to be a phenolic (from Ishida) or a poly(arylene ether) (from Davis).

In addition, there is no disclosure, teaching or suggestion in Davis to look to either Dershem '194 or Dershem '195 for a benzoxazine compound at all, let alone one in liquid form at room temperature. And there is no disclosure in either Dershem '194 or Dershem '195 to look to Davis for a benzoxazine compound, irrespective of its physical state.

Only the present invention provides a thermosetting resin composition, and a method for enhancing the adhesive strength thereof, based on such a benzoxazine compound in liquid form at room temperature together with one or more thermoset compounds defined in a Markush group -- i.e., selected from the group consisting of epoxy, cyanate ester, maleimide, acrylate,



methacrylate, vinyl ether, styrenic, vinyl ester, propargyl ether, diallylamide, aromatic acetylene, benzocyclobutene, thiolenes, maleate, oxazoline, and itaconate, optionally, one or more anti-oxidants, bleed control agents, fillers, diluents, coupling agents, adhesion promoters, flexibilizers, dyes and pigments, and a cure initiator.

As noted above the group of recited thermoset compounds set forth as a Markush group does not include a phenolic or a poly(arylene ether), irrespective of whether the specification indicates "and the like" when referring to types of thermoset compounds suitable for the practice of the invention.

Frankly, there is no motivation for persons of ordinary skill in the art to look to the two cited Dershem documents, to remedy the deficiencies of Ishida and Davis as references, or vice versa, to reach the invention as now claimed.

In the Action, page 6, paragraph 2, the Examiner contends that:

because the patented and presently claimed inventions possess the same components, a property such as coefficient of thermal expansion of those components is considered to be inherent to the components because a

component and its properties cannot be separated.

However, inherency is a concept that may be advanced under 35 U.S.C. § 102, not under 35 U.S.C. § 103. There are no rejections in the instant Action under Section 102. In addition, what is abundantly clear from the record is that the compositions disclosed by each of the three cited U.S. patents and the composition defined in the claims now pending herein do not in fact "possess the same components".

It is a fundamental principle that the invention is defined by the claims as a whole, considering all of the language used to define the invention. One is not simply to parse selected portions of the invention as so defined and then search the state of the art for each of those selected portions with the goal of later recombining those selected portions found in the state of the art to reach the invention as claimed as a whole.

What's more, one is not simply to modify these selected portions of the state of the art to fit them together in an attempt to reach the invention as claimed either. Such modification destroys the documents cited for what they actually do disclose and teach.

The Examiner's determination of obviousness could only have come about from the use of impermissible hindsight. Hindsight as the Examiner knows can find no place in the examination of applications for Letters Patent.

The citation in the Action to In re McLaughlin is of no moment, because it is well settled by more recent case law from the Court of Appeals for the Federal Circuit that there must be some clear and particular teaching, suggestion or reason to combine the documents cited in the manner in which they have been cited so as to achieve a reasonable expectation of success in reaching the invention as claimed. No such clear and particular teaching, suggestion or reason exists in those documents and thus no reasonable expectation of success could exist.

The rejection of the pending claims instead has clearly been based on hindsight reconstruction, which as noted above, is an impermissible way in which to construct a prima facie case of obviousness.

Having failed to set forth in the Action a case of prima facie obviousness, the Examiner's invitation for Applicants to provide certain data (Action, page 3, paragraph 7, page 4, paragraph 9 and pages 5-6, paragraph 1) is not

reasonably calculated to sway the determination of patentability.

At the risk of sounding redundant, Applicants remind the Examiner that the test for establishing a teaching, motivation, or suggestion, whether or not implicit, in the documents of record is what combination of statements therein would have suggested the claimed combination to those persons of ordinary skill at the time the invention was made, considered in the context of the teaching of each of the entire documents, and not viewed in the abstract or at the time of examination. The rejection of claims cannot be predicated on the mere identification in the documents of record of individual components of the recitations in the claimed combination; rather, particular findings must be made as to why the skilled artisan, with no knowledge of the claimed invention, would have selected the specific components for combination in the manner claimed. In re Kotzab, 55 USPQ2d 1313, 1318 (Fed. Cir. 2000).

Because the documents relied upon by Examiner, taken individually or collectively, do not include any disclosure, teaching, motivation or suggestion to formulate a thermosetting resin composition which comprises, in the same composition:

- (i) a benzoxazine component;

(ii) the benzoxazine component being in liquid form;  
and

(iii) one or more thermoset compounds selected from epoxy, cyanate ester, maleimide, acrylate, methacrylate, vinyl ether, styrenic, vinyl ester, propargyl ether, diallylamide, aromatic acetylene, benzocyclobutene, thiolenes, maleate, oxazoline, and itaconate, the invention defined by Claims 36-48 is not properly rejected as obvious over Ishida alone or in combination with Davis and the two Dershem documents discussed above.

Thus, a person of ordinary skill in the art would have no reasonable expectation of success in reaching the invention as so claimed.

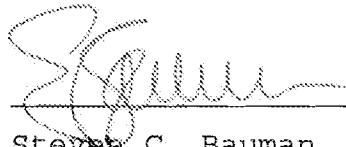
In sum, only Applicants have defined an invention in such terms.

Based on the above, therefore, Applicants submit they are deserving of patent protection for the pending claims and the application is in condition for allowance.

Application No. 10/735,119  
Amendment dated January 29, 2007  
Office Action dated December 19, 2006

Applicants' undersigned attorney may be reached by telephone at (860) 571-5001, by facsimile at (860) 571-5028, or by email at [steve.bauman@us.henkel.com](mailto:steve.bauman@us.henkel.com). All correspondence should continue to be directed to the address given below.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read 'S. Bauman', is written over a horizontal line.

Steven C. Bauman  
Attorney for Applicants  
Registration No. 33,832

HENKEL CORPORATION  
Legal Department  
1001 Trout Brook Crossing  
Rocky Hill, Connecticut 06067  
Customer No. 31217